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PEMBROKE,

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A NOTE ON THE FATE OF INDIVIDUALS HOMOZYGOUS FOR CERTAIN COLOR FACTORS  
IN MICE

ISBEN and Steigleder have reported on certain breeding experiments with mice which produce evidence in support of the view advanced by Castle and the writer in 1910, and later strengthened by Kirkham, 1917, that homozygous yellow mice were formed but perished during embryonic life.

At the time that they were collecting their data, the writer was, on a smaller scale, carrying on similar experiments. In the course of these experiments, certain data confirmatory to the results of Isben and Steigleder and of Kirkham were obtained. It seems best at this time to put these results on record.

The embryos referred to as "abnormal" may be considered as falling in Isben's and Steigleder's Class A of dead embryos, that is to say, those in which development ceased shortly after implantation as contrasted with those in which death had resulted probably from overcrowding within the uterus during the latter part of the period of gestation.

Three types of matings to control the results in yellow  $\times$  yellow crosses were made. In all cases, the non-yellow animals used were taken from the same stock as that producing the yellows. The control matings made were as follows: Yellow female  $\times$  non-yellow male, non-yellow female  $\times$  yellow male and finally non-yellows crossed *inter se*. The numbers obtained are small and are grouped together in the following table:

TABLE I

♀	♂	Normal	Abnormal
11696 Brown	11713 Yellow	11	—
11776 Brown	11717 Yellow	7	—
11438 Brown	—	7	—
11442 Yellow	Brown	6	1
11562 Yellow	Brown	9	—
10619 Yellow	Brown or Black	2	—
		42	1

The *one* abnormal embryo consisted of a small apparently embryonic mass, with a blood clot closely jammed in between two normal embryos. It will be noted that from these matings 97.6 per cent. of the embryos are normal and 2.4 per cent. abnormal.

When yellows are crossed *inter se* a very different result is obtained, as may be seen from the following table, which shows the result of such matings:

TABLE II

♀	♂	Normal	Abnormal
Yellow D	Yellow	4	1
Yellow H	Yellow	7	3
Yellow F	Yellow	7	2
Yellow G	Yellow	6	3
11867	11711	6	0
11786	Yellow	8	2
Yellow E	Yellow	7	1
Yellow B	Yellow	10	0
11151	11162	2	1
12916	Yellow	5	0
Yellow J	Yellow	7	3
11149	Yellow	4	2
Yellow A	Yellow	7	0
Yellow C	Yellow	4	1
11926	11477	3	0
12672	— 99 Sooty Yellow	4	2
		91	21

18.7 Per cent. abnormal,

81.3 Per cent. normal.

From this table it will be seen that 81.3 per cent. of the embryos produced are normal, and 18.7 per cent. are abnormal. If one considers in addition the fact that Kirkham obtained embryological evidence that certain embryos broke down even before implantation, it seems probable that the fate of the homozygous yellow mouse is known.

One other point of some interest should be noted. In 1915 the writer reported on the hereditary behavior of black-eyed white spotting in mice. At that time it was found that this character behaved in a similar manner to yellow in that no animal homozygous for it was obtained. Later it was found (1917) that black-eyed white spotting was, however, entirely independent of yellow in heredity, although its behavior was analogous.

If the uteri of black-eyed white females which are pregnant by black-eyed white males are examined they are, in some cases, found to contain a certain number of abnormal embryos of the same gross appearance as those occurring in the yellow  $\times$  yellow matings. The numbers obtained are small but striking.

TABLE III

♀	♂	Normal	Abnormal
Black-eyed White A	$\times$ Black-eyed White	3	1
11413	$\times$ 11466	1	5
Black-eyed White B	$\times$ Black-eyed White	5	0
—73	$\times$ Black-eyed White	7	0
		16	6

The percentage of abnormal embryos is 27.2. While this last mentioned cross should be repeated, it nevertheless indicates that, like the homozygous yellow embryo, the homozygous black-eyed white embryo breaks down, in most cases at least, after its implantation in the uterus.

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